

**WHAT IS CLAIMED IS:**

1           1. An apparatus for redundancy of a voice processing unit in a media gateway system  
2 including a circuit switch part and a packet switch part, comprising:

3           a circuit switch unit comprising a TDM space switch, the circuit switch unit being  
4 connected to a plurality of circuit interface units;

5           a plurality of voice processing units converting voice signals into packet data and  
6 converting packet data into voice signals;

7           a protection voice processing unit that serves to replace a disabled voice processing unit  
8 from among said plurality of voice processing units;

9           a circuit-side cross point switch connecting channels switched through the TDM space  
10 switch to the corresponding voice processing units according to the setup of a main control unit;

11          a packet switch unit comprising a packet switch, the packet switch unit switching packet  
12 data from the voice processing units, and outputting the switched data to a plurality of packet  
13 interface units; and

14          a packet-side cross point switch connecting the packet switch unit to the voice processing  
15 units according to the setup of the main control unit, said main control unit being programmed and  
16 configured to control the whole system through an inter-processor communication to download  
17 connection information of the disabled voice processing unit to the protection voice processing  
18 unit, and to set up an input port number and an output port number of the packet side and the  
19 circuit side cross point switches during a redundancy switch process of the voice processing unit.

1           2. The apparatus of claim 1, wherein the circuit-side cross point switch is installed in the  
2 circuit switch unit.

1           3. The apparatus of claim 1, the circuit-side cross point switch connecting each of said  
2 voice processing units directly to corresponding ports on the TDM space switch and said cross  
3 point switch being transparent when no voice processing units are disabled.

1           4. The apparatus of claim 1, wherein connections of voice processing units to ports on the  
2 TDM switch are set up under the control of the main control unit.

1           5. The apparatus of claim 1, the packet-side cross point switch being installed in the  
2 packet switch unit.

1           6. The apparatus of claim 1, the packet side cross point switch connecting each of said  
2 voice processing units directly to corresponding ports on the packet switch and said packet side  
3 cross point switch being transparent when no voice processing units are disabled.

1           7. The apparatus of claim 1, wherein connections of input and output ports of the packet-  
2 side cross point switch are set up under the control of the main control unit.

1           8. The apparatus of claim 1, further comprising a circuit interface unit side cross point  
2 switch disposed between the plurality of circuit interface units and a TDM switch, said circuit  
3 interface unit cross point switch being controlled by said main control unit when a substitution of  
4 a redundant circuit interface unit for a disabled circuit interface unit is made.

1           9. The apparatus of claim 8, wherein the circuit interface unit side cross point switch is  
2 disposed within the circuit switch unit.

1           10. The apparatus of claim 1, further comprising a packet interface unit side cross point  
2 switch disposed between said plurality of packet interface units and the packet switch for  
3 redundancy of the packet interface units.

1           11. The apparatus of claim 10, wherein the packet interface unit side cross point switch  
2 is disposed within the packet switch unit.

1           12. The apparatus of claim 1, the main control unit being programmed and configured to  
2 download connection information of the active voice processing unit to a temporary storing unit  
3 in the main control unit, the main control unit also being programmed and configured to perform  
4 a switch process in order to rapidly switch the disabled active voice processing unit in board  
5 removal or function failure.

1           13. The apparatus of claim 1, wherein the main control unit is programmed and configured  
2 to directly download connection information of the disabled active voice processing unit to the  
3 protection voice processing unit, and to switch the disabled active voice processing unit to the  
4 protection voice processing unit in order to safely perform the switch process according to a  
5 forcible switch command transmitted from an element management system for maintenance and  
6 repair of the disabled active voice processing unit.

1           14. The apparatus of claim 1, wherein the voice processing unit has different functions  
2 according to interworking types to VoIP, VoATM and VoP networks.

1           15. The apparatus of claim 1, wherein the protection voice processing unit receives a  
2 function of the disabled voice processing unit from the main control unit in board initialization,  
3 and resets a voice processor and the other devices on the board.

1           16. The apparatus of claim 15, wherein the protection voice processing unit is not  
2 informed which voice processing unit function it will receive among the N active voice processing  
3 units, and thus receives the connection information in the initialization of the switch process.

1           17. A method for redundancy of a voice processing unit for processing voice signals in  
2 a media gateway system including a circuit switch unit and a packet switch unit, comprising the  
3 steps of:

4           confirming that an active voice processing unit is to be disabled;  
5           sensing, by the active voice processing unit to be disabled, board removal when the switch  
6           type of the active voice processing unit is board removal;  
7           notifying a main control unit by the active voice processing unit to be removed a presumed  
8           removal state;  
9           transmitting an acknowledge response signal from the main control unit to the active voice  
10          processing unit to be removed via an inter-processor communication bus;  
11          downloading connection information from the active voice processing unit which will be  
12          removed to the main control unit via the inter-processor communication bus;  
13          changing the setup of cross point switches connected to the circuit switch unit and the  
14          packet switch unit by the main control unit;  
15          switching off the active voice processing unit and switching on a protection voice  
16          processing unit by the main control unit;  
17          transmitting the connection information downloaded from the active voice processing unit  
18          to the protection voice processing unit by the main control unit; and  
19          resuming service after the protection voice processing unit receives the connection  
20          information.

1           18. The method of claim 17, further comprising the steps of:  
2           sensing function failure by the active voice processing unit when the switch type of the  
3           active voice processing unit is function failure;

4 notifying the main control unit of the function failure by the active voice processing unit;  
5 downloading connection information of the active voice processing unit by the main  
6 control unit via the inter-processor communication;  
7 changing the setup of the cross point switch connected to the circuit switch unit and  
8 changing the setup of the cross point switch connected to the packet switch unit by the main  
9 control unit;  
10 switching, by the main control unit, the active voice processing unit to the protection voice  
11 processing unit;  
12 transmitting the connection information downloaded from the active voice processing unit  
13 to the protection voice processing unit by the main control unit; and  
14 resuming service after the protection voice processing unit receives the connection  
15 information.

1 19. The method of claim 17, further comprising the steps of:  
2 receiving a switch command of the active voice processing unit from an element  
3 management system when the switch type of the active voice processing unit is the switch  
4 command from the element management system;  
5 downloading connection information of the active voice processing unit to the protection  
6 voice processing unit by the main control unit via the inter-processor communication; and  
7 changing the setup of the cross point switches connected to the circuit switch unit and the  
8 packet switch unit by the main control unit;

9           switching off the active voice processing unit and switching on the protection voice  
10   processing unit; and  
11           resuming service.

1           20. The method of claim 17, the redundancy being accomplished absent resetting the TDM  
2   switch and absent table update process for the packet switch.